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Original research article

Influence of physiotherapy on knee joint pain after arthroscopy

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ABSTRACT

The article deals with the topic of the influence of physiotherapy on arthroscopic treatment of the knee joint. The goal is to verify whether the selected methods of kinesiotherapy using physical therapy will lead to a decrease in pain and stability of the knee joint in patients who have undergone arthroscopy. The sample group consisted of 50 patients who underwent an arthroscopic surgical operation of the knee joint. They were divided into two groups. The control group consisted of patients who were not recommended a post-operative physiotherapeutic treatment. They were discharged for home treatment. The intervention group consisted of patients who underwent ten therapies. To prove the influence of physiotherapy on pain and the stability of the knee joint, selected standardized questionnaires were used. They were filled in immediately after the operation and four weeks later. Initial and final kinesiology assessments were carried out, including aspection, palpation, goniometric and anthropometric measurement and examination of muscle strength. The results show that the selected physiotherapeutic methods decrease pain of the knee joint and improve its stability in patients who have undergone arthroscopy. They also eliminate swellings, and have a positive effect on the strength and mobility of the operated limb. They help patients to quickly return to a fully active daily life. It is important to choose physiotherapy methods for each patient individually because individual dispositions and possibilities are not the same. Positive results can be reached combining various physiotherapy methods. Nevertheless, these results cannot be reached without the patient's active collaboration.

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Introduction

Lower limbs enable the most natural kind of locomotion – walking. Their significance in the support and movement of the erect body on two legs is major, which is the reason for our robust limbs having strong groups of muscles [1]. Great overexertion of articular facets and pressure are the reason the knee joint is predisposed to degenerative changes and injuries. The knee joint belongs to the most frequently injured joints of all. The reasons for the increasing percentage of injured young people are problems connected to injuries in sports, such as tennis, football, skiing, snowboarding and hockey [2]. Most of these patients are forced to seek medical help due to the symptoms of an injury, such as pain, swellings, knee joint instability and others. What is most important are the right diagnostics and the recognition of the type of pain because it can be grounded in various causes [3]. To set the right diagnostics, we use different depictive methods, such as X-ray, MRI, ultrasound and arthroscopic examinations, which enable an operation from 2 min openings [4].

A large number of people suffering from knee joint injury report pain, problems with stability, swellings, and partially limited mobility. They also report bad or very low level of information [5]. Most patients are discharged after the arthroscopy operation on the same day, and the next time they see their doctor is the day of the extraction of the stitches. Many of these patients are not informed enough about the possibilities of the following physiotherapy, which helps them to reach better stability and shortens their convalescence.

Arthroscopy and the examination of the knee joint

Arthroscopy is a modern diagnostic and surgical method with minimum invasion. It is a method after which a very small scar remains and the patient can soon return to a normal life [6]. The operation begins with a small incision of about 1 cm, where an endoscope probe called an arthroscope is inserted. At the end of the metal tube, a small camera with a cold light is installed, which televises the operation. The arthroscopy tube or a stand-alone intake cannula with a sterile physiological solution is inserted. A thin surgical tool is inserted in the other side of the joint, which not only enables a view of the inside of the joint, but also of the articular cartilage, meniscus, ligaments and the whole articular case. The tool may enable an operation [7,8], whose length depends on its seriousness but it most often takes 30–60 min. After a standard arthroscopy, the patient can be discharged immediately. In more complicated cases, they are hospitalized for 3–4 days. A systematic assessment of the whole knee and an internal examination must precede the operation [9]. Arthroscopy is carried out in the whole or spinal anaesthesia.

All inner articular changes in the knee joint are an indication for treatment. We assign some types of fractures and arthritic changes to arthroscopy operations, as well as the reconstruction of the anterior cruciate ligament, treatment of torn ligaments, damaged cartilages (chondromalacia), the removal of the inflammatory inner articular epithelium (synovectomy) and a partial or full meniscectomy of the damaged meniscus [10].

Kinesiotherapy methods and physical therapy

After a surgical operation, kinesiotherapy treatment with timely mobilization and verticalization is ideal. Frequent neglect and the wrong treatment of such injuries can lead to a quicker emergence of arthrosis or joint instability [11]. Exercising muscles for joint stabilization plays an important role. Our attention is focused on the prevention of muscle shortening and atrophy. We use positioning to prevent contractures with limited mobility [12]. We further focus on extensor knee muscles because insufficient treatment causes patellar and femoral arthrosis or insertion difficulties [13].

Passive and active exercise: passive movements are performed without the activity of the patient during the first post-operative days with regard to swellings, pain and the possibilities of the operated limb. Active exercise is performed under the therapist's supervision, where they help or control the movements so that they are performed in the best way possible. Active exercise uses other isometric contractions as well [14].

Soft and mobilization techniques: they help preserve the free mobility of these tissues. Mobilization is performed in joints, but it can be used in all mobile structures connected to the motor system [15]. Functional limitations of the joint mobility (blocks) are usually connected to so-called trigger points. These points are one of the main causes of blocks and that is why, in mobilizations, neuromuscular techniques are used so that the muscles are relaxed at the same time. The techniques are, for example, PIR – post-isometric relaxation and IR – reciprocal inhibition. PIR enables reaching a greater range of joint movement and relaxing shortened muscles through inhaling and exhaling [16,17].

Kinesiotaping: it is a kind of fixing bandage (often used in sports) and it belongs to the gentlest technique because it preserves blood circulation. It belongs to the so-called functional techniques of the prevention of the treatment of the muscular skeletal system instead of the former fixation plaster bandage [18]. It is easier to prevent the consequences connected to the fixation treatment. Taping shortens the treatment and increases the feeling of security. “Taping” can be used long term, for a few weeks, but also short term during a one-time load. The fixation also strengthens the chronically weakened ligaments after acute injuries, because it stabilizes and fixes the joint for the stabilization of functionality [16].

Exercising with balls and elastic tensions: small or big balls (so called over balls) are used for mobilization and stretching exercises, but also for toning exercises in order to strengthen the weakened muscles and improve co-ordination. Exercises with elastic tensions use rubber bands which are about 15 cm wide. The tensions are used for strengthening and influencing hypertonic and shortened muscles by influencing articular mobility and training co-ordination [19].

Exercising in closed and opened kinematic series: while exercising in opened series, the terminal body segment is loose, which results in the exercising of individual muscles in isolation. While exercising in closed series, all of the muscle series are activated, thanks to which it is necessary to activate multiple joint muscles and co-contract agonists and antagonists. The therapy should first include exercises from the closed series, especially in the first phases of physiotherapy,

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